



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada



MARKET OUTLOOK REPORT

Volume 2 Number 6

CANADA WHEAT SECTOR PROFILE PART ONE: OVERVIEW

November 26, 2010

Market Analysis Group
Grains and Oilseeds Division
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www.agr.gc.ca/gaod-dco

Canada

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Electronic version available at
www.agr.gc.ca/gaod-dco

ISSN 1920 20082X
AAFC No. 11301E

Market Outlook Reports are published by the
Market Analysis Group
Grains and Oilseeds Division
Food Value Chain Bureau
Market and Industry Services Branch
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Paru également en français sous le titre
RAPPORT SUR LES PERSPECTIVES DU MARCHÉ
Volume 2 numéro 5
PROFIL DU SECTEUR CANADIEN DU BLÉ
PARTIE UN : UN APERÇU
ISSN 1920 200838
N° AAC 11301F

WHEAT SECTOR PROFILE

PART ONE: OVERVIEW

Canada is one of the largest producers and exporters of high quality wheat in the world. This Market Outlook Report, part one of a two part series, focuses on supply and demand characteristics of the Canadian wheat industry. Part two will review the current organizations of the Canadian wheat industry.

GLOBAL WHEAT INDUSTRY

On average (2005/2009), global wheat production is around 637 million tonnes (Mt). The major wheat producing countries are: the European Union-27 (EU-27) which produces 133 Mt or 21% of global production, China with 108 Mt, India with 75 Mt, United States (US) with 58 Mt, Russia with 54 Mt, Canada with 25 Mt or 4% of global production, and Australia with 18 Mt.

Most wheat production is consumed in the country of origin and only around 20% (123 Mt) is traded internationally (average 2005/2009). The major exporting nations are: the US at 27 Mt or 22% global share, Canada at 17.5 Mt (14% global share), the EU-27 at 17 Mt, Russia at 14 Mt and Australia at 12 Mt.

CANADIAN WHEAT PRODUCTION

Where Wheat is Grown

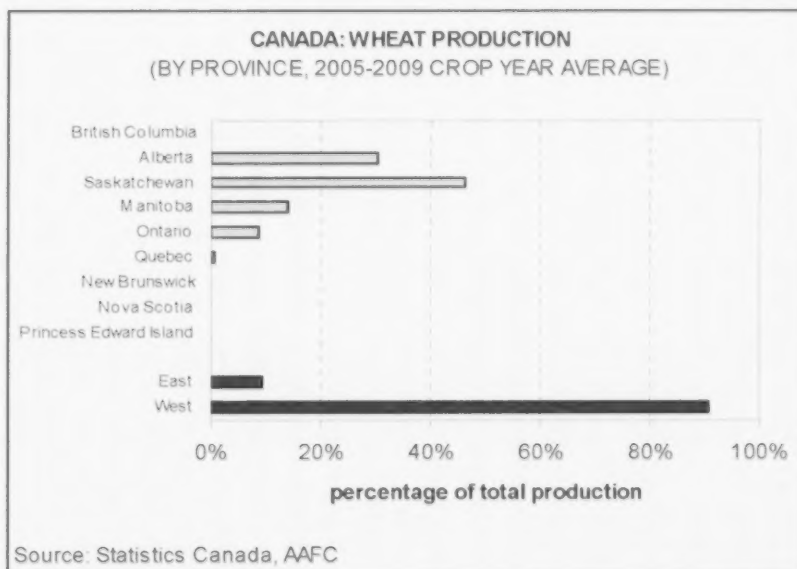
The majority of Canadian wheat is grown in the Prairie Provinces of Western Canada: Saskatchewan with 46% of total production, Alberta with 30% and Manitoba with 14%, based on the five year average of 2005-2009. In Eastern Canada, production is led by Ontario with 9%, Quebec with 1% and the Atlantic region produces less than 1% of total wheat production.

Number of Wheat Producers

According to the 2006 Statistics Canada (STC) *Census of Agriculture*, there are 60,743 farmers producing wheat. This indicates a 10 year decline (from 93,545 in 1996) as around 33,000 producers either exited the agriculture industry or switched out of wheat into other more profitable crops. This decline is a North American trend as Canadian farmers have increased canola production and US farmers have increased production of soybeans and corn. Even though the number of producers is declining, the average area of wheat per farm has actually increased by around 20% to 161 hectares (ha) in 2006 from 133 ha in 1996.

Area Seeded

The area seeded to **all wheat** has been steadily declining over the past 15 to 20 years, from 14.2 million hectares (Mha) in 1990 to 10.1 Mha in 2009. Over that period the area seeded to all wheat



compared to the total area seeded to all crops has decreased from 43% to 34%. However, within this broad number, there are distinct trends for spring wheat, durum wheat and winter wheat.

The area seeded to **spring wheat**, excluding durum, has been steadily declining over the past 15 to 20 years from 11.6 Mha in 1990 to 8.2 Mha in 1999 to 6.8 Mha in 2009, a 41% decline. This is mainly due to farmers switching some area into other crops, in particular canola.

The Prairie Provinces produce most of the spring wheat in Canada. In 2009, area seeded to spring wheat was 6.8 Mha, of which approximately 6.7 Mha (98.5%) was in Western Canada. Saskatchewan has the largest seeded area of 3.2 Mha (almost half of total seeded spring wheat area), followed by Alberta (2.4 Mha) and Manitoba (1.1 Mha).

Area seeded to **durum wheat** has been relatively flat over the past 20 years ranging from 2.1 Mha in 1990 to 1.8 Mha in 1999 to 2.3 Mha in 2009.

Saskatchewan has the largest durum wheat seeded area. In 2009, total area seeded to durum wheat was 2.3 Mha, of which 1.9 Mha (around 83% of total area) was in Saskatchewan and 0.38 Mha was in Alberta. Very little durum was seeded in Manitoba or Eastern Canada.

The area seeded to **winter wheat** has been slowly increasing from 0.46 Mha in 1990 to 0.75 Mha in 2009. This is a 63% increase. This increase can mainly be attributed to strong prices combined with favorable autumn planting conditions.

In 2009, the total area seeded to winter wheat was 0.75 Mha, of which 0.37 Mha was seeded in Western Canada and 0.39 Mha was seeded in Eastern Canada. Ontario continues to dominate as the largest single province (0.38 Mha seeded area) but seeded acreage in Western Canada has

been increasing in recent years due to varietal improvements and good yields.

Manitoba (0.10 Mha), Saskatchewan (0.16 Mha) and Alberta (0.10 Mha) all have steadily increased seeded area.

Yields

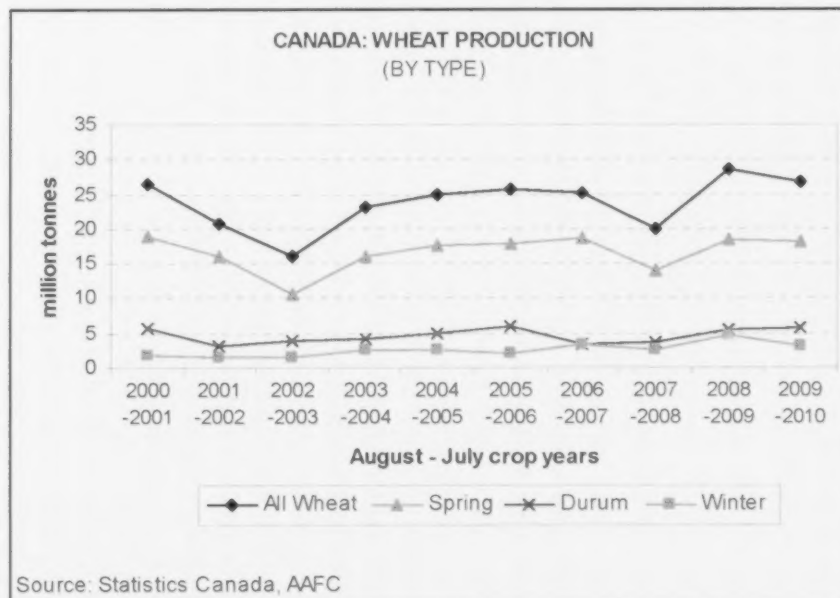
Wheat yields over the past 10 years have averaged 2.8 tonnes per hectare (t/ha) over all wheat classes. In 2009, yields averaged 2.7 t/ha for **spring wheat**, 4.0 t/ha for **winter wheat**, and 2.3 t/ha for **durum wheat**. These yields are on a par with the global and US average of 3.0 t/ha over all wheat classes.

However, Canadian yields are generally lower than the average yields of our main competitors: the European Union (5.7 t/ha), China (4.8 t/ha), and the Ukraine (3.7 t/ha). This is due to a number of factors. In Europe, higher moisture levels (basically they get more rain) contribute to higher yields. In addition to climatic factors, Canada also mainly grows spring wheat, which is inherently lower yielding but with higher protein.

Production

With relatively stable yields, wheat production has followed the same trends as seeded area. Total production of **all wheat** was 32.1 Mt in 1990, 30.0 Mt in 1999 and 26.8 Mt in 2009.

Production of **spring wheat** was 22.57 Mt in 1990, 17.45 Mt in 1999 and 18.12 Mt in 2009. The declining production pattern, of around 20% over the past 20 years, has been due to relatively low



net returns of wheat as compared to competing crops.

In 2009, Saskatchewan was the largest producer of spring wheat with 7.2 Mt, followed by Alberta (5.2 Mt) and Manitoba (3.4 Mt). The combined western provinces account for 89% of all spring wheat production, which is on a par with the production pattern of the past 20 years.

Production of **winter wheat** was 1.67 Mt in 1990, 1.7 Mt in 1999 and 3.0 Mt in 2009. This shows an increase in production of 50% over the past 20 years. However, winter wheat production is only 14% of total wheat production in Canada (2009).

In 2009, Ontario was the largest producer of winter wheat with 1.85 Mt, followed by Manitoba (0.44 Mt), Saskatchewan (0.41 Mt) and Alberta (0.27 Mt). Overall, the eastern provinces accounted for 63% (1.87 Mt) of total winter wheat production, and the western provinces accounted for 37% (1.12 Mt).

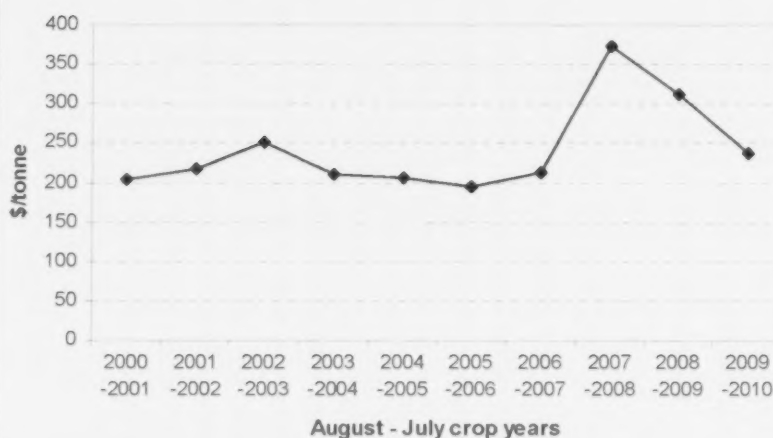
Production of **durum wheat** was 4.2 Mt in 1990, 4.3 Mt in 1999 and 5.4 Mt in 2009. In 2009, Saskatchewan produced 4.4 Mt (81%) of total durum production with Alberta producing 1.0 Mt (19%).

Prices

Canada is essentially a price taker in the world wheat market with prices influenced by the US futures markets. Wheat and durum varieties are priced separately, as they have different end uses and markets. In general, for all wheat exports, for similar grades and proteins, Canadian prices are competitive with export prices of US wheat. For the domestic market, Canadian millers pay a price competitive with their US miller counterparts.

Wheat (excluding durum) prices fluctuate based on global supply and demand fundamentals. The 10 year average (1999-2008) of the CWB Pool Return Outlook (PRO) for No. 1 Canada Western Red Spring Wheat (CWRS, 13.5% protein) was CAN \$242/tonne. In recent years, prices peaked in 2007

CANADA: CWB WHEAT POOL RETURN OUTLOOK
(NO. 1 CWRS 13.5% PROTEIN, I/S VANCOUVER/ST. LAWRENCE)



Source: Canadian Wheat Board

(in line with global commodity price increases) to a high of \$372/t. Since 2008, wheat prices have stabilized at trend levels and the price for 2010 is estimated at \$238/t.

The CWB PRO for Durum followed a similar path, with a 10 year average for No. 1 Canadian Western Amber Durum (12.5% protein) of \$280/t and \$275/tonne (11.5% protein). Durum prices peaked in 2007 reaching a high of \$515/t. In 2008, prices began to stabilize and are expected to return to trend levels of \$195/tonne by 2010.

Wheat Exports

Canadian wheat is exported all over the world and is desired for its uniformity and consistency. The majority of wheat exports are spring wheat varieties (in particular hard red spring wheat) and in some markets Canadian wheat can command a premium over the world price.

About 13.6 Mt are exported (2005-2009 average). The top export markets for Canadian wheat consistently are: the United States, Indonesia, Iraq and Japan.

However, there are also a number of other countries that import Canadian wheat on a periodic basis depending upon price and need. For instance, in 2008, Iran imported 1.8 Mt due to a poor Iranian crop that year, whereas the previous year it imported only 0.1 Mt of Canadian wheat and had zero imports in 2006.

Durum Exports

About 3.8 Mt (including products) of durum is exported (2005-2009 average). Canada exports around 80% of its durum production, with top markets being Italy, United States, Algeria, Morocco and Venezuela.

Imports

Canada imports only around 25,000 tonnes of **wheat** and wheat products annually for feed use or food production. Virtually no **durum** wheat is imported.

Domestic Use

On average (2005/09) 7-8 Mt of **wheat** (excluding durum) is used domestically, representing around 24% of total supply. Within domestic use, the milling and baking sectors represent about 43% of wheat used (more information on the milling and baking sector is found in a later section of this report). Wheat used for animal feed, residual waste and dockage represents about 45% of domestic use. Seed use, as farmers save wheat for replanting, represents around 11% and industrial use is the remaining 2%.

For **durum** wheat, on average (2005/09) less than 1.0 Mt is used domestically which represents about 20% of total use. Within this, about 50% is used as animal feed, waste and dockage. The remaining use is for food (28%) and seed (21%).

In recent years, the biofuels industry in the Prairie Provinces has been using wheat as the primary feedstock for ethanol production. The wheat used is generally downgraded wheat damaged by frost, disease or rains. Ethanol producers tend to use lower grade Canada Western Spring Wheat and softer wheat classes. There are currently 7 ethanol production plants in Western Canada with a combined capacity of 500 million liters, requiring about 1.3 Mt of wheat at full capacity.

CANADA: WHEAT (EXCLUDING DURUM) EXPORTS

August – July crop years	2005 -2006	2006 -2007	2007 -2008	2008 -2009	2009 -2010	2005-2009 Crop Year Average
million metric tonnes						
United States	1.11	1.96	1.63	1.87	1.53	1.62
Iran	0.52	0.00	0.10	1.79	0.00	0.48
Indonesia	0.92	1.45	1.27	0.91	0.62	1.03
Japan	1.02	0.92	0.92	0.81	0.77	0.89
Saudi Arabia	0.00	0.00	0.00	0.80	0.73	0.31
Iraq	0.60	0.63	0.48	0.76	1.19	0.73
Mexico	0.89	1.21	0.49	0.76	0.90	0.85
Other	6.42	8.43	7.72	7.22	8.75	7.71
Total	11.48	14.60	12.61	14.92	14.49	13.62

Source: CATS - 1001.9000

CANADA: DURUM EXPORTS

August – July crop years	2005 -2006	2006 -2007	2007 -2008	2008 -2009	2009 -2010	2005-2009 Crop Year Average
million metric tonnes						
Italy	0.57	0.54	0.30	0.54	0.44	0.48
United States	0.53	0.65	0.52	0.60	0.48	0.56
Algeria	0.36	0.65	0.76	0.60	0.36	0.55
Morocco	0.56	0.54	0.60	0.52	0.47	0.54
Venezuela	0.44	0.46	0.51	0.31	0.27	0.40
Tunisia	0.15	0.16	0.01	0.23	0.12	0.13
Belgium	0.24	0.25	0.31	0.18	0.16	0.23
Other	1.30	1.19	0.18	0.70	0.45	0.76
Total	4.15	4.44	3.19	3.68	2.75	3.64

Source: CATS - 1001.1000

WHEAT CLASSES

Wheat is not a single homogeneous commodity, but is made up of many different types and classes, each with its own distinct characteristics and end uses. All current registered varieties of Canadian wheat have been developed through traditional (not genetically modified) breeding programs. Research into new wheat varieties and types are focused on better disease resistance, higher yields, and enhanced quality characteristics.

Spring Wheat

In the Prairie Provinces, the dominant wheat is hard spring wheat which is planted in the spring (May) and harvested between mid-August to mid-October. Hard wheat is desired for its gluten strength and high protein content. It is widely used for blending with other wheat and in the production of high volume pan breads. Spring wheat grows best in areas with lots of sunshine and adequate moisture,

especially when the grains are filling. It takes approximately 90 days from wheat emergence to full maturity when the crop can be harvested.

About 70% of all wheat is planted to the Canadian Western Red Spring (CWRS) class. Around 16% is planted to winter wheat. The remainder is distributed between spring wheat classes.

Durum Wheat

Durum wheat is spring wheat, but it is distinct from the other wheat varieties in its milling and end use characteristics. Durum has a very hard kernel with an endosperm (inner part of the kernel that is milled into flour) of a pale yellow color as compared to the white endosperm of common wheat. These attributes make durum well suited for the production of pasta products as it maintains a firm texture after baking and an amber coloring. Although durum wheat is seeded in the spring in Canada, most of the world's production is actually seeded in the fall.

Winter Wheat

In Eastern Canada, the dominant wheat is a soft winter wheat which is planted in October and is harvested in late-June to early-July. Soft wheat is desired for its lower protein and gluten strength and is widely used for cakes and pastries.

WHEAT QUALITY

Canadian wheat is known around the world for its high and consistent quality. This is partly due to the strict controls on variety registration and grading standards. Canadian wheat is often "branded" as one of the cleanest and most uniform-quality products on the export market. The top Canadian export wheat is No. 1 CWRS, which is the highest grade Canadian wheat.

DID YOU KNOW?

One bushel of CWRS wheat

- weighs 60 pounds or 27.22 kilograms
- yields 45.5 pounds or 20.64 kilograms of white flour
- yields 57 pounds or 25.85 kilograms of whole wheat flour
- makes 70 loaves of white bread baked weight of 1 pound
- makes 90 loaves of whole wheat bread baked weight of 1 pound

Source: Canadian International Grains Institute

Variety Registration

The decision to register a new variety is made by the Variety Registration Office (VRO) of the Canadian Food Inspection Agency (CFIA). The CFIA only registers new varieties that have been recommended by regional committees such as the Prairie Registration Recommending Committee for Grain (PRRCG) and the Eastern Standards Committee (ESC). Any variety that does not meet the standards of the committee will not be recommended for registration for production. The variety would then only be able to be grown as feed wheat and could not be sold in the premium domestic or export markets.

Kernel Visual Distinguishability (KVD)

In addition to the variety registration process, wheat varieties were also subject to the KVD requirement which specified that all kernels must have the same appearance of other wheat of that class (in order to easily identify all wheat of a certain class by appearance at the time of delivery for segregation purposes). KVD was only a requirement for wheat and only wheat grown in the CWB growing area.

However, as of August 1, 2008 the KVD requirement was removed for all classes of western wheat. In lieu of the KVD system, the grain industry and producers have implemented a system of affidavits/declarations, identity preservation, process verification systems and testing. It is thought that the removal of the KVD requirement eases the way for development of new wheat varieties.

MARQUIS WHEAT

Marquis wheat is the forerunner of nearly every variety of modern bread wheat grown in western Canada. About one hundred years ago, Canadian scientists Percy and Charles Saunders cross-bred Red Fife wheat (brought from Scotland by a farmer who obtained the seeds from a Polish ship that carried wheat from the Ukraine) and Hard Red Calcutta (brought from India) to produce a new variety they named Marquis. Due to its early maturing, resistance to heavy winds and high flour yields, Marquis greatly extended the area where wheat could be grown. By the early 1920s, Marquis was the dominant wheat variety accounting for close to 90% of all wheat grown in the Prairie Provinces. Marquis revolutionized Canadian agriculture in that it brought agricultural and economic prosperity to the Prairie region enabling great numbers of immigrant farmers to settle and prosper in the southern areas of these provinces.

Wheat Grading

Canadian wheat grading is based on a numerical system defined by the *Canada Grain Act* and Regulations and is administered by the CGC. The Act provides for the appointment of the Eastern and Western Standards Committees, which recommend specifications for the grades to the CGC. The Standards Committees are made up of farmers, government officials, Canadian Wheat Board officials, processors and exporters. Grade definitions are only changed if there is evidence that it would increase the acceptability of Canadian grain in world markets.

Wheat grades are based on five key factors: test weight, varietal purity, vitreousness, soundness, and foreign material. **Test weight** is a measure of kernel density, where heavier is better. For example, CWRS No.1 grade requires a kernel weight of 79 kilograms per hectoliter (kg/hl), measured at the primary elevator and again at export terminal. **Varietal purity** is the percentage of non-registered varieties and other classes in the sample taken to be assessed. For example, CWRS No.1 can have no more than 1.5% of additional non-CWRS grains in the sample taken.

Vitreousness is the natural translucent appearance that indicates hardness. CWRS No.1 requires a minimum of 65% hard vitreous kernels. **Soundness** refers to the degree of damage due to factors such as frost, immaturity, weathering, disease and improper storage. There are separate numerical tolerances for the factors that can be measured and a limit on total damage

from all factors. **Foreign material** is anything other than the grain remaining after the dockage (eg. seeds, stems, straw) has been removed. There are separate tolerances for each material, such as stones and other grains. For CWRS No.1, the total foreign material is limited to 0.4% for export. In comparison, feed wheat may contain up to 10% dockage at the primary elevator and 5% for export.

All Canadian grading factors can be quickly assessed by the grain buyer at the time wheat is delivered to a primary elevator, allowing for efficient segregation of different qualities. The higher grades achieve higher prices.

In addition, within each of the top grades, the wheat is further segregated on the basis of protein content. Any wheat destined for export is graded by CGC inspectors, at terminal elevators or primary elevators (for direct shipments) to ensure that any wheat leaving Canada for any destination has met the minimum export grade standards.

Research and Development

To date, there has been limited private sector development of new wheat varieties. The majority of research is publicly funded through the federal and provincial governments and also through the use of a levy on wheat sales through the CWB directed to the Western Grains Research Foundation (WGRF). The WGRF funds a variety of public projects in wheat research with a current focus on disease resistance and enhanced yields.

Appendix 1

CANADA: WHEAT (EXCLUDING DURUM) SUPPLY AND DISPOSITION

Aug - July crop year	2005 -2006	2006 -2007	2007 -2008	2008 -2009	2009 -2010
Seeded Area (thousand hectare)	7,347	8,316	6,799	7,752	7,775
Harvested Area (thousand hectare)	7,125	8,164	6,710	7,616	7,408
Yield (tonne/hectare)	2.78	2.68	2.44	3.03	2.90
thousand tonnes					
Carry-in stocks	5,435	6,424	5,608	3,587	4,644
Production					
Winter Wheat - West	631	939	1,285	1,983	1,119
Winter Wheat - East	1,602	2,365	1,215	2,704	1,877
Canada Western Hard Red Spring Wheat	15,045	16,183	11,659	15,480	16,162
Canada Eastern Hard Red Spring Wheat	376	457	445	410	320
Canada Western Extra Strong Wheat	291	280	191	303	213
Canada Prairie Spring Wheat	1,251	1,139	1,122	1,217	1,102
Canada Western Soft White Spring Wheat	127	143	128	686	370
Other Western Spring Wheat	511	413	328	309	290
Total Production	19,834	21,919	16,373	23,092	21,448
Imports	22	25	20	23	115
Total Supply	25,291	28,368	22,001	26,702	26,207
Exports					
Grain	11,177	14,687	12,482	14,813	14,582
Products	249	262	200	153	191
Total Exports	11,426	14,949	12,682	14,966	14,772
Domestic Use					
Food	2,742	2,703	2,628	2,509	2,460
Industrial	178	411	394	571	740
Seed	824	683	782	773	713
Feed, waste, dockage and handling loss*	3,697	4,014	1,928	3,239	2,408
Total Domestic Use	7,441	7,811	5,732	7,092	6,322
Total Use	18,867	22,760	18,414	22,058	21,094
Carry-out Stocks	6,424	5,608	3,587	4,644	5,113
Stocks-to-use ratio	34%	25%	19%	21%	24%
Seeded Area (thousand acres)	18,154	20,549	16,800	19,155	19,212
Harvested Area (thousand acres)	17,606	20,173	16,580	18,819	18,305
Yield (bushel/acre)	41	40	36	45	43
CWB Pool Return** (\$/tonne)	186	209	369	302	220
Exchange Rate (CAN\$/US\$)	1.16	1.13	1.01	1.17	1.05

* calculated residually

** CWB No. 1 CWRS 12.5% protein in store St. Lawrence/Vancouver

Source: Statistics Canada and AAFC - October 2010

Appendix 2

CANADA: DURUM SUPPLY AND DISPOSITION

Aug - July crop year	2005 -2006	2006 -2007	2007 -2008	2008 -2009	2009 -2010
Seeded Area (thousand hectare)	2,307	1,536	1,949	2,440	2,291
Harvested Area (thousand hectare)	2,278	1,518	1,926	2,416	2,230
Yield (tonne/hectare)	2.60	2.20	1.91	2.28	2.42
thousand tonnes					
Carry-in stocks	2,487	3,273	1,257	819	1,903
Production					
Production	5,915	3,346	3,681	5,519	5,400
Imports	3	2	3	2	2
Total Supply	8,405	6,621	4,941	6,340	7,305
Exports					
Grain	4,226	4,432	3,129	3,601	3,557
Products	47	47	46	38	34
Total Exports	4,273	4,479	3,175	3,639	3,591
Domestic Use					
Food	248	257	229	236	262
Seed	146	185	232	218	126
Feed, waste, dockage and handling loss*	465	443	487	344	619
Total Domestic Use	859	885	948	798	1,006
Total Use	5,132	5,364	4,123	4,437	4,597
Carry-out Stocks	3,273	1,257	818	1,903	2,708
Stocks-to-use ratio	64%	23%	20%	43%	59%
Seeded Area (thousand acres)	5,701	3,795	4,816	6,029	5,661
Harvested Area (thousand acres)	5,629	3,751	4,759	5,970	5,510
Yield (bushel/acre)	39	33	28	34	36
CWB Pool Return** (\$/tonne)	189	223	510	373	197

* calculated residually

** CWB No. 1 CWAD 12.5% protein in store St. Lawrence/Vancouver
Source: Statistics Canada and AAFC - October 2010